Atmospheric Transmission Model through Autonomous Visibility Measurement

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Abstract

Performance of deep space optical communications is impacted by atmospheric outages. By monitoring known stellar objects with calibrated telescopes, atmospheric attenuation statistics can be recorded. This paper describes a program to develop an atmospheric transmission model for optical communications by making autonomous visibility measurements of known stellar objects from three locations in the southwest US. The data will be correlated and infused with weather data to establish the atmospheric transmission model, This model will be used in link margin analyses for optical communications channels. The statistics will be updated on a quarterly basis and calibrated using image data taken over a long period of time. This calibration is expected to allow extrapolation to other ground-based locations through the use of global weather data bases,